Electronic Supporting information

Smart phone assisted rapid, simplistic, straightforward sensitive biosensing of cysteine over essential amino acids by β-cyclodextrin functionalized gold nanoparticles as a colorimetric probe

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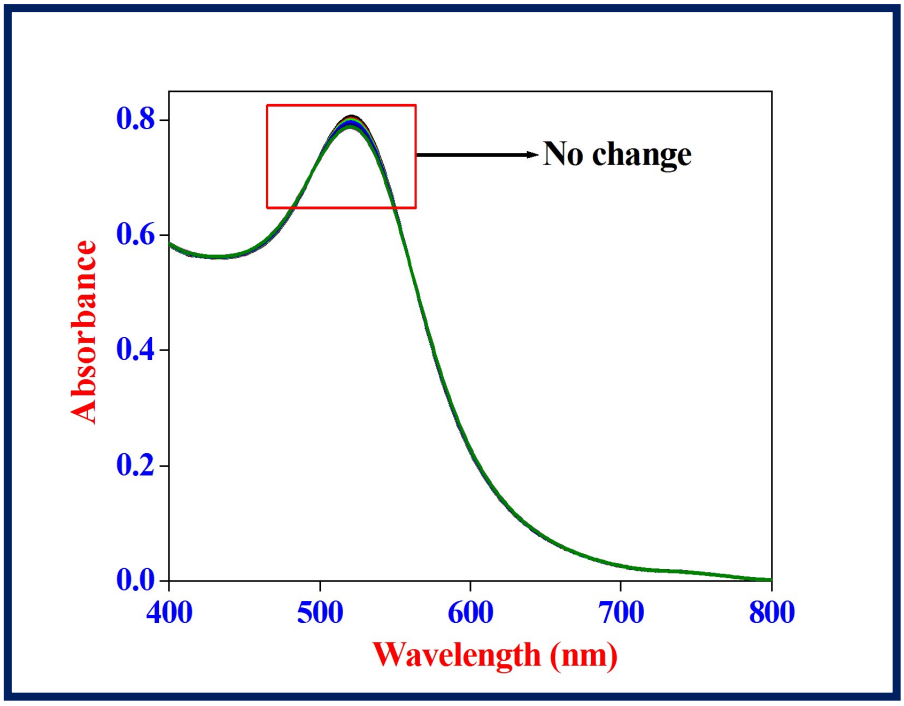

Fig. S1. Absorption spectral studies of β-CD AuNPs with increasing concentrations of NaCl. [NaCl]= 2-100 mM.

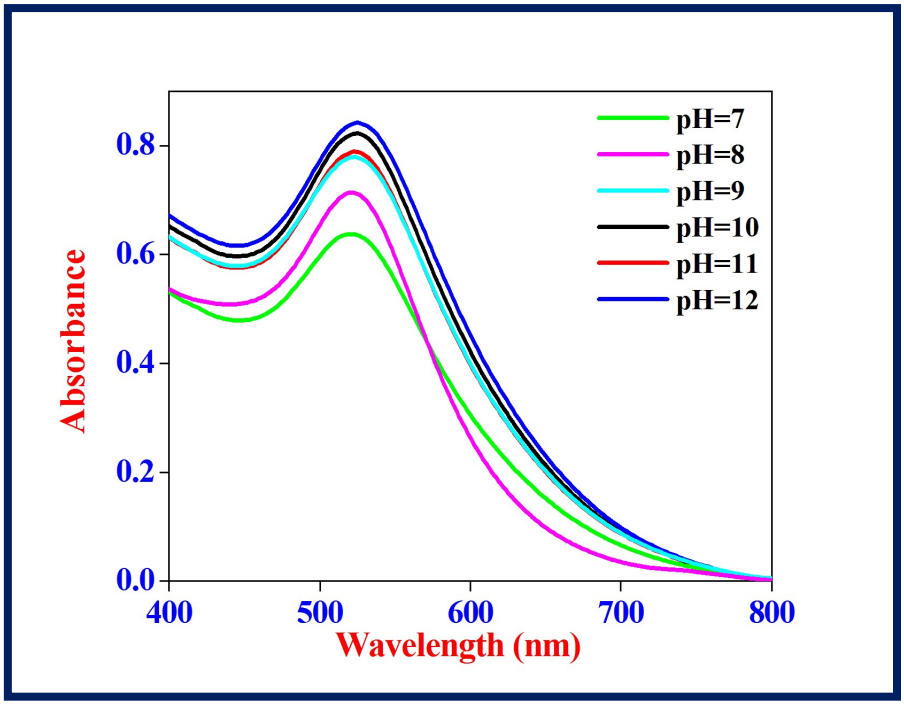

Fig. S2. Absorption spectral studies of β-CD AuNPs with different pH ranges from 7 to 12.

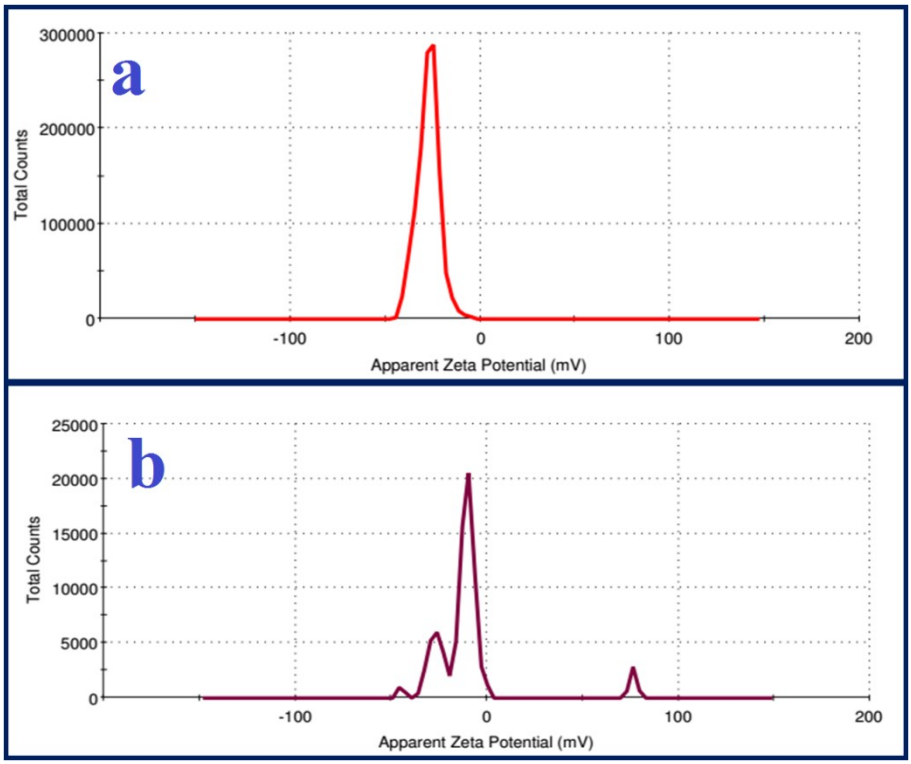

Fig. S3. Zeta potential results for β-CD AuNPs alone (a) and β-CD AuNPs with Cys (b).

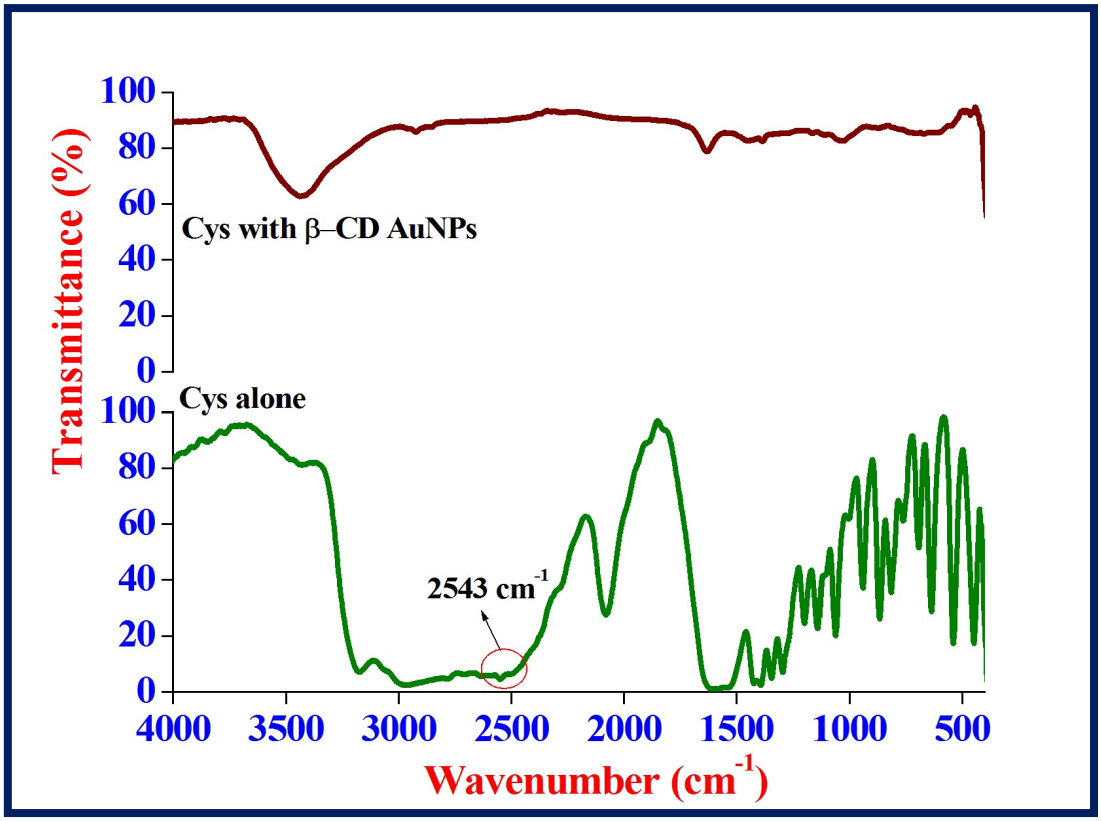

Fig. S4. FT-IR spectra of Cys alone and Cys with β-CD AuNPs

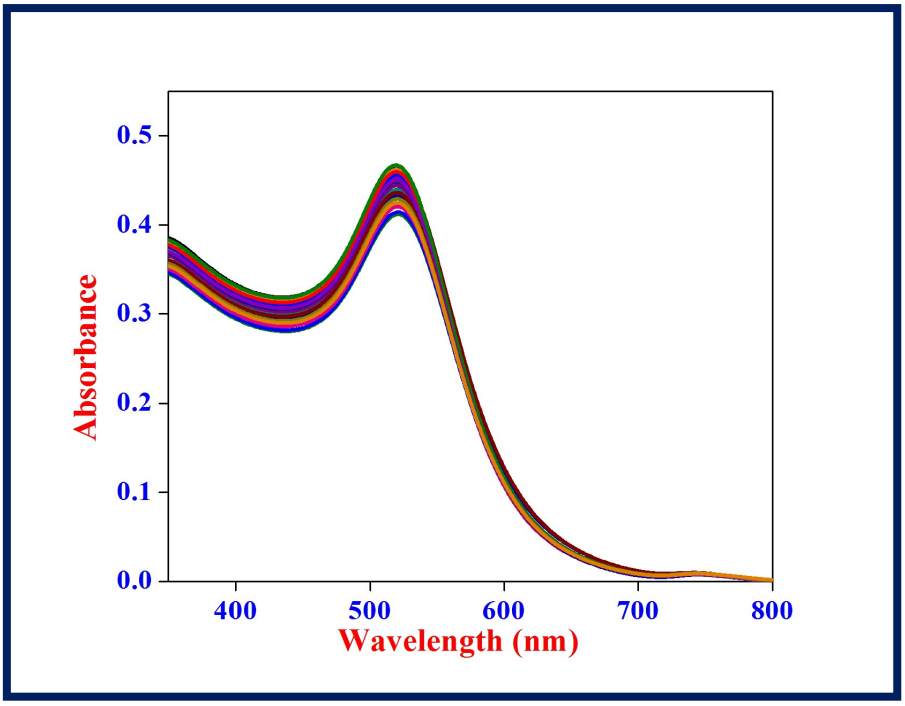

Fig. S5. SPR band changes of β-CD AuNPs probe toward the 10-fold higher concentrations of various common metal ions (Ag^{+}, Au^{3+}, Cu^{2+}, Cd^{2+}, Ca^{2+}, Mn^{2+}, Ni^{2+}, Pb^{2+}, S^{2-}, SO_4^{-}, Mg^{2+}, SCN^{-} and NO_3^{-} ions) in PBS (pH=8.0).

Table S1. Comparison of present method with previously reported methods.

Method	Nanoprobe	Linear Range	LOD	Real Samples	Ref
Colorimetry	**β-CD AuNPs**	**0.25-5.0 µM**	**25.47 nM**	**Blood serum and Urine**	**This work**
Colorimetry	β-CD AgNPs	3-45 µM	4.65 nM	Blood serum and Urine	10
Colorimetry	TA- AuNPs	2 to 100 µM	0.894 µM	---	44
Colorimetry	G-AuNPs	4–35 µM	50 nM	---	51
Colorimetry	Xylan-AuNPs	0 to1000 µM	0.57 µM	Blood Plasma	52
Colorimetry	Kiwi juice-prepared AuNPs	50 nM to 1.0 µM	6.2 nM	---	53
Colorimetry	Pectinase @AuNPs	4.8 nM to 0.01 M	4.6 nM	Urine	54
Colorimetry	DIC-Au NPs	10 to 90 µM	2.2 µM	Urine and Plasma	55
Colorimetry	AuNPs	0 to 1000 µM	0.0779 µM	---	56
Colorimetry and fluorometry	RB-AuNPs	0.02-5 µM	10 nM	---	57
Colorimetry	Dex/Ag NPs	100 µMto 1 mM	12.0 µM	---	58
Colorimetry	NC-dots/AuNPs	0.01 to 2.0 µM	5.0 nM	Serum	59
Fluorescence	BODIPY–AuNPs	6.6 -26.4 µM	0.894 µM	Live cells	60
Fluorescence	Fib-Au NCs	76 nM to 300 µM	76 nM	Live cells	45
Fluorescence	aN-dots and AuNPs	0.3 - 3.0 µM	0.1 µM	Human serum and urine	61

β-CD – β-cyclodextrin, TA – 1,3-diamino-2-hydroxypropane-N,N,N',N'-tetraacetic acid, G-AuNPs – Green synthesized gold nanoparticles, DIC– Dicoumaral, RB – Rhodamine B, Dex – Dextran, NC – dots nitrogen-doped carbondots, BODIPY–4,4-difluoro-4- bora-3a,4a-diaza-s-indacene, Fib– amyloid fibril, aN-dots–amino Nitrogen Quantum dots